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Planetary rationality as a means of avoiding global threats to the development of human civilisation

Konrad Prandecki *

Institute of Agricultural and Food Economics, National Research Institute, ul. Świętokrzyska 20, 00-002 Warsaw Poland

Abstract

Planetary rationalityis a concept for the control of development in selected areas, with the aim of avoiding global threats to the continued development of human civilisation. The nature of these problems is such that they can be solved only at the level of the planet as a whole. The principles of planetary rationality may be applied by adherents both of the neoclassical concept of full rationality, and of behavioural economics, which draws attention to the limited scope of rational decision-making. This idea is a precondition for sustainable development, and is significantly easier to put into practice, as it requires action only in areas where threats exist, that is, where such action is most urgent. This approach greatly increases the chance of success, compared with existing holistic concepts. The purpose of this article is to evaluate the concept and its suitability in the light of existing needs, as well as the possibility of putting it into practice. These considerations are supported by a critical analysis of the available literature.

Keywords: Planetary rationality, Sustainable development; Future studies; Globalisation, Global threats

* Corresponding author. *E-mail address:* kprand@interia.pl

1. Introduction

In futures studies, reference is often made to threats in the form of adverse global phenomena which might lead to a breakdown in the development of the whole of human civilisation. Three principal causes of such events are commonly distinguished (Porwit, 2009, pp. 2–3):

- widening of the huge gap between living conditions in rich and poor regions;
- uncontrollable processes involving destruction of the quality of the environment, such that it is no longer sufficiently healthy for human life (this concerns both the natural environment and the environment of interpersonal relations in cultural or spiritual contexts);
- manifestations of mutual discord, up to gross levels of violence.

Particular attention is paid to environmental issues, as these are characterised by a high degree of inertia, meaning that once ecosystems have been brought to a state of catastrophe it is very difficult, or even impossible, to restore them. For this reason, priority attaches to considerations that indicate global threats, namely threats which affect the whole of humanity. A prototype of such analyses is the first report of the Club of Rome (D. H. Meadows et al., 1972), which in its successive updated versions (the last one dated 2012) indicates how the trends described are borne out by reality. Similar studies concerning global threats appear every few years (de Boer and Lammertsma, 2012; Galwas and Wyżnikiewicz, 2014; Jackson, 2009; Randers, 2012) and point out the increasing risk of the formation of global environmental barriers to thedevelopment of civilisation.

Contemporary discussion on this subject is dominated by two concepts: planetary boundaries (PBs) (Rockström et al., 2009) and global catastrophicrisks (GCRs) (Bostrom and Cirkovic, 2011). An interesting development is the combination of both of these approaches into a single instrument, called Boundary Risk for Humanity and Nature (BRIHN)(Baum and Handoh, 2014).

The above-mentioned concepts focus primarily on identifying threats. Research shows that both the consequences of fundamental changes in the environment, and the systemic structure of environmental threats, are poorly researched and little understood (Baum and Handoh, 2014).It therefore remains desirable that work be undertaken in this area. It should be noted, however, that these tools serve only to identify threats, without focusing on mechanisms for counteracting them. The latter question is just as important as the evaluation of growing problems, because scientific researchers often make the unjustified assumption that once a threat is identified, humanity will automatically rise to the challenge and alter its existing behaviour. In practice this occurs extremely seldom.

The present article will focus on the concept of planetary rationality as a tool facilitating the taking of global decisions that make it possible to reduce the risk of global catastrophe. Emphasis is placed on two issues: evaluation of the concept and its suitability in the light of existing needs, and the possibility of its being put into practice. The considerations here are theoretical in nature. This means that the primary tool used to attain the aforementioned objective is critical analysis of the available literature, supported by inductive reasoning.

2. Rationality – fundamental issues

Rationality is defined as *"a characteristic of conscious human activity whereby appropriate means are selected to achieve intended goals"* (PWN, 2004, p. 41). It is often divided into objective and methodological rationality (Kotarbiński, 1955). Objective rationality is the selection of means to achieve a goal in a way that is appropriate to a real, objectively perceived situation. Methodological rationality, in turn, is understood as action adequate to the goal from the point of view of the decision-maker, in accordance with that person's state of knowledge.

The Nobel prize winner F. Hayek (1973) divided rationality into constructivist and ecological. Both forms function in parallel, with mutual interactions. Constructivist rationality is the deliberate use of reason to perform analysis and to recommend actions which are evaluated as superior to the alternative feasible solutions (Smith, 2009, p. 2). Ecological rationality is sometimes understood in terms of an evaluation of behaviours within the framework of a specific human environment (Darley and Kauffman, 1996), but this does not fully explain the matter. Smith (2009, pp. 36–40) reasons that ecological rationality has its roots in biological processes and evolution. This means that, in contrast to constructivist rationality, where rational human action is always the cause of particular behaviours, here the source of many processes can be found in the natural environment, whose conditions influence the selection of decisions. In this way, ecological rationality makes it possible to explain situations in which human actions appear to be irrational.

There currently exist three fundamental viewpoints onrationality, asserting the existence of:

1) full rationality– the view that all decisions are taken based on the application of reason and with full access to information;
2) limited rationality – decisions are taken in conditions of restricted access to information and in situations where many parties make choices based on irrational premises, although most decisions still have a rational character when account is taken of the conditions in which they were made;
3) irrationality – decisions are taken based on emotions and the actions of others, without consideration of rational premises.

The belief in the full rationality of human decisions arises out of Enlightenment philosophy, in particular utilitarianism and the classical and neoclassical theories of economics. However, psychological research into human beings and the causes of their decisionshas led to the conclusion that in the decision-making process people use reason only to a small extent, being guided much more often by emotions (cf. Albin, 1998; Kahneman and Tversky, 2000). Five basic groups of factors causing irrationality are currently identified: psychological disturbances; consequences of medical problems (such as the need to take medicines which affect perception); age (both children and elderly people are often guided by impulse rather than reason); membership of a particular social class (lack of education, material limitations, restricted freedom); and level of intelligence (Yang and Lester, 2008, p. 1228). In consequence, it is stated with increasing frequency that the role of rationality must be considered as limited, or even negated, in the processes of explaining human behaviours. Such trends are also noticeable in economic theories.

3. Rationality in neoclassical and behavioural economics

In the social sciences, rationality is most simply interpreted as the management of affairs with the engagement of reason. In theory, everyone knows what this means, but in practice it is extremely difficult to define the concept precisely. In economics, rationality is interpreted in many different ways. A fundamental criterion is the evaluation of the rationality of decisions taken. In this way we obtain the aforementioned concepts of full rationality, limited rationality and absence of rationality in decision-making.

The question of the rationality of economic actions has been a subject of analysis ever since the birth of the economic sciences. Important considerations on this point can be found in the writings of Adam Smith, John Stuart Mill and Jeremy Bentham, leading to the view that the fundamental principle of economic activityis the tendency to maximise the individual target function (utility, monetary income). As a result, the paradigm of *homo economicus* was introduced and came to be commonly applied in economics. This refers to an individual who always acts rationally to achieve the best possible results given the available resources (maximisation of benefits), or else aims to achieve a set goal with the least possible input (minimisation of costs). A measure of rationality, therefore, is efficiency defined in a quantitative manner, answering the question of whether something can be done more cheaply or faster, or else whether greater benefits can be attained from a given quantity of inputs.

It was based on these assumptions that Eugen Slutsky formed his theory of consumer choice, claiming that a person always proceeds rationally, but that depending on the conditions in which he finds himself – among other things, on the available resources (funds) – his decisions may differ. On this basis, conclusions have been drawn concerning the substitution and income effects (Stankiewicz, 1998). This leads to the conclusion that decisions which appear contradictory may still be considered rational.Such thinking came to dominate both liberal and Keynesian economics, but years of observation have led to the rejection of the assumption of full rationality of economic actions.

Doubts arise with respect to two kinds of issue. Firstly, the above-mentioned psychological research indicates that emotions play a significant role in decision-making processes. Secondly, the assumption of full access to information is challenged by ever greater barriers. One of these is the occurrence of external effects, namely phenomena (both positive and negative) which are not included in the economic calculation. This results from both ignorance of these phenomena and the inability to express them in terms of monetary value.

These observations lead to two different conclusions. The first is that rationality plays no role in decision-making processes, or that it is of little significance. Supporters of this view are clearly in the minority, because in many cases such a radical claim is not borne out by the facts. The second viewpoint is that a limited rationality operates. As was noted by H. Simon (1957), humans are more prone to maximise satisfaction than utility. Accordingly, a person does not maximise profit, but merely satisfies himself with such profit as allows survival, effective competition and possibly development. This is a result of, among other things, the expansion of markets, which has led to a situation in which it is not possible to collect a full set of data, and certainly not to process them so as to obtain full knowledge. In effect, a person, in taking decisions, is guided by partial information or intuition resulting from, among other things, analogy in relation

to previous experiences. This last way of taking decisions is called by H. Leibenstein "selective rationality", which involves, among other things, the application of known schemes of action (Leibenstein, 1976). The goal is to obtain the maximum benefit, but adjusted according to the preferences of the individual, such as those related to ability to withstand pressure.

Contemporary research based on the concept of behavioural economics leads to the conclusion that an approach based on the idea of limited rationality can explain decision-making processes more fully. Nonetheless, in comparison with the classical perception of rationality, it is more rarely applied in economic practice.

The above considerations are limited to the field of microeconomics. It should be remembered that the concept of rationality can also be used to explain macroeconomic phenomena. This can serve to explain collective actions, where the investigation of individual processes is a method rather than an axiom (Blume and Easley, 2007). In this way it is possible to evaluate, for example, the hypothesis of rational expectations.

In Poland in the 1970s and 1980s, a slightly different approach to macroeconomic rationality was taken. This resulted from the application of socialist ideology, which produced a different view of macroeconomic rationality, because it served not to explain the rationality of decisions taken by society, but to allocate resources within the economy (Sadowski, 1980). In this way it became a justification for the economic policy conducted in conditions of insufficient resources. In the case of macroeconomic rationality (regardless of the way in which it is presented), according to the works of Oskar Lange, the measure of rationality is taken to be national income (Czarny, 1997). This means that all economic decisions are taken based on the market, on an analysis of costs and benefits, and on utility for the consumer. For this reason, methods that go beyond that scheme do not have much application. As a result, benefits which cannot be expressed in terms of money are not considered "rational". This includes various kinds of external phenomena whose social and environmental consequences may have a significant impact (both positive and negative) on prospective benefits.

At the level of the firm, the internalisation of these effects normally involves an increase in costs computed in money terms, which causes strong resistance to putting them into business practice. In macroeconomics (at national level) the occurrence of negative external effects again produces certain financial consequences, but the situation becomes more difficult, as possibilities of valuation are fairly limited. Knowledge in this area is increasing year by year. In turn, positive external effects are more and more rarely noticed by society, and as a result the internalisation of external effects comes to be popularly associated chiefly with increased costs. Consequently decisions are made taking into account only a limited set of factors, and hence it is hard for them to be considered fully rational.

4. Planetary rationality

The global nature of many economic phenomena means that they are more and more frequently considered to require analysis at the level of the whole planet (Prandecki, 2014). This applies, in particular, to threats,

such as those of an environmental or financial nature. In consequence, it is coming to be frequently proposed that anew branch of economics should be created, namely planetary economics (Grubb, 2014).

The need for rational action at worldwide level was noted as early as the 1970s by Pajestka (1973), who in his later works (Pajestka, 1990) developed his concept, referred to as global or existential rationality. As he himself acknowledged, his approach went significantly beyond the usual understanding of rationality in economic studies. He described it as a socioeconomic rationality. He believed that it was necessary to move away from a narrow understanding of rationality (Pajestka, 1983, p. 94):

> *"For that reason also, as a starting point for further considerations I wish to take the most general definition, that we are seeking that which is good for people, subjecting this to rational analysis and consideration. It is in this sense that I shall use the term socioeconomic rationality. We will continually learn what is more rational in socioeconomic activity, we will apply it to new areas, develop new concepts for the understanding of what is rational, and introduce new methods of analysis. This approach seems to me to be more appropriate than adopting a definition of rationality defined by a method of deductive reasoning, supposedly expressing some kind of absolute rationality. I therefore regard it as sensible to use the aforementioned elements of a conscious shaping of processes for defining different areas of the concept of rationality, where these different areas are characterised by the fact that they require a different understanding of rationality."*

As is noted by Wierzbicki (1991), the above approach conflicts with the dominant viewpoints in economics, which may prove to be a fundamental barrier to the realisation of the principles of this concept. He therefore suggests calling it *global responsibility* or *planetary consciousness*, which provides the possibility of avoiding additional discussion. Nonetheless, such an approach can be considered to be an element of a new, global economics, which like macroeconomics makes use of somewhat different tools and criteria than microeconomics. It therefore seems that it is not necessary to abandon the concept of rationality, even though in many cases its use continues to provoke debate.

A similar approach, although on a smaller scale, can be observed in those movements which attempt to bring environmental issues into economics. These are based on the assumption that it is necessary to make a long-term analysis of costs and benefits, while also taking account of external effects in the economic calculation. There exist many approaches to this problem. The earliest of them was the creation of environmental economic balances (cf. Prandecka, 1991). More sophisticated attempts are undertaken within the framework of the concept of sustainable development. In this case it is necessary to distinguish the differing approaches to this idea found in environmental economics and ecological economics (Jeżowski, 2000). The first of these bases its considerations on neoclassical economics, and thus a belief in the existence of full rationality, while the second accepts that rational actions are taken based on a wider set of factors than just the maximisation of benefits. The latest movement involving the taking into account of environmental factors in economics may be that related to the concept of the green economy. This differs somewhat from sustainable development; however it is not a substitute for it, but rather a means of its realisation. The

definitions concerning the economic aspects of the two concepts are similar (Ryszawska, 2013, p. 53). The principal feature distinguishing the two is the increased emphasis on the economic aspects of human functioning and the need for attitudes to be changed by means of economic factors.

It is significant that, with the exception of environmental economics based on neoclassical ideas, the other movements encourage (though not always directly) a broader understanding of rationality, which must above all take account of the criterion of sustainability, analysed in the long term, taking account of the needs of future generations. Only such an approach can lead to the implementation of effective tools enabling the avoidance of global barriers to growth and to the continued existence of human civilisation.

It is therefore necessary to specify how the concept of planetary rationalityis to be interpreted. In brief, it can be defined as an open set of behaviours enabling the avoidance of global barriers to development. Where necessary it may be extended to cover additional issues where the aim is to counteract the risk of catastrophe. At the same time, this set should be limited only to priority issues which are of fundamental importance for the continuation of human existence. Determining which instruments should be included in it is a secondary matter. It is important to adopt the assumption that a human, as a rational being, has the ability to foresee the effects of his actions, and thus also has the capacity for conscious creation of socioeconomic processes. This represents a move away from the paradigms of modern economics, as regards not only the neoclassical understanding of rationality, but also the assumption that the invisible hand of the market represents an optimum choice. As J. S. Mill (1848) notes, a person should not only be interested in movement (growth), but should also ask where it leads. This means that humanity should acquire the ability to control development. The adoption of a planetary approach to rationality is the first step in that direction. Planetary rationality may also be called social rationality, because its goal is the creation of conditions for development which aim to achieve a social optimum[1], enabling the best possible development of humanity as a whole.

A significant difference between the established approach and the planetary approach to rationality lies in the way in which the problems are perceived. In the past it has been assessed, based on observations, whether people take a rational approach in decision-making processes. In the case of planetary rationality, it is indicated that it is necessary for such decisions to be taken, which represents in a way the imposition of particular attitudes. This may be effected by means of a number of instruments, ranging from the most moderate in the form of education and the raising of social awareness, through economic stimuli that provide encouragement to act, up to the creation of defined sets of norms and systems of punishments for their violation. Their application results from the need to pay attention to the long-term sustainability of development against the prospect of a rising human population.

Planetary rationality would appear to be a solution that is essential in order to maintain the future development of human civilisation. It does not contradict economic rationality (on either the neoclassical or behavioural view), but merely extends it. The anthropogenic criterion of utility remains dominant. A significant change is the increased number of factors taken into consideration. The classical factors of production, namely land, work and capital, take on a broader significance which takes account of long-term

[1] By social optimum, I mean a set of benefits taking account of both environmental and social needs.

benefits for society. In practice, this means the need to take account of environmental and social aspects of economic management. There is also a need for a worldwide approach to problems, because the growing human population and corresponding pressure on the environment have created a situation in which an increasing number of threats are of a global nature. These threats can be effectively counteracted only with the use of tools that operate on the same scale, namely that of the planet as a whole.

In reality, both full and limited rationality are linked with the question of maximisation of benefits. Everyone sees as rational those attitudes which ensure the greatest possibly utility. In addition, under theories of limited rationality, solutions are regarded as rational even if for various reasons they do not lead to an optimum choice, but lead to a set of results which are considered satisfactory (Leibenstein, 1976; Simon, 1986). They enable the individual actor (a human, firm or state) not only to maintain the status quo, but also to develop further; hence they are desirable.

5. Planetary rationality in practice

The concept of planetary rationality is intended to serve to reduce the risk of occurrence of global threats to the development of civilisation. There are many publications drawing attention to the need for such action. The main challenges noted are those related to excessive exploitation of natural resources, which in the future may cause problems not only in access to new electronics-based technologies, but above all in relation to energy, water and food. These last two factors constitute an essential condition for the existence of humanity in its present form. Therefore, apart from non-moral (not related to morality) values such as pacifism or holism (Szyszkowska, 2014), it is they which ought to be the priority in further development. Moreover, global trends in consumption, and in particular its massive rise in the most populous developing countries, tend to lead to the conclusion that in the foreseeable future, that is up to the middle of the century, the usage of resources, goods, services and food will increase (Prandecki et al., 2013). In consequence it is hard to foresee a movement onto the path of sustainable development, which would reduce the risk of occurrence of various threats.

Apart from the aforementioned sustainable development, there exist a number of ideas concerning the further development of civilisation which address global challenges. Some of them encourage reduction in the human population, as in the case of survivable development(D. L. Meadows, 1995); others point to the need to limit consumption, as in zero growth theory(Jackson, 2009), degrowth (Lorek and Fuchs, 2013), and ecohumanism (Michnowski, 2011); but none presents arguments which would serve to persuade society to adopt it. The problem of long-term sustainability is of little importance for people living mainly in the present and concentrating most of their attention on multiplying the quantity of goods that they own. A possible alternative is the concept of the blue economy(Pauli, 2010), but this has a very selective nature, that is, it points to possibilities of change and of a totally different approach to the management of resources, but is not oriented towards priorities and the seeking of solutions in risk areas, only towards the seeking of solutions wherever that may be possible.

Planetary rationality addresses similar problems, and in addition tries to solve them on a global scale, which means that account must be taken of the complications resulting from the various international interests. In practice, in contrast to the concepts mentioned above, as well as to sustainable development, planetary rationality is based on an "escape forward", that is, the seeking of new ways out of the existing situation. One example of such thinking is the "enough" concept (Dietz and O'Neill, 2013), which shows that an excess may be equally harmful as a shortage of a particular good or service.

In practice, this means searching for new, innovative solutions which are capable of bringing the desired results. For example, the actions taken so far to reduce carbon dioxide emissions are not producing the effects anticipated. Statistics show that global emissions continue to rise (IPCC, 2013; Le Quéré et al., 2013; Olivier et al., 2013). Even if China keeps its promises to reduce emissions after 2020, this will be only a drop in the ocean of what is needed, and will probably not produce significant changes, just as there is no sign of any global effects resulting from European climate policy. In the current economic conditions, where the functioning of states is based on GDP growth, the war on climate change, even if declared by governments, takes on only such forms as will not harm the economic development of the country in question. It is easiest to condemn those technologies which have only marginal applications in one's own territory, and to promote others which may bring profits. With time, as in the case of biofuels, for example, it may turn out that the environmental harm resulting from the whole of the product lifecycle is greater than the benefits, but a country can nonetheless boast that it is taking appropriate action. In such cases, in accordance with the principles of planetary rationality, it is necessary to seek new solutions enabling attainment of the desired goal. In the case of climate change, instead of the ineffective attempts to reduce emissions, it may be more beneficial to stimulate actions to enable the absorption of greenhouse gases, such as afforestation or the use of catch crops in agriculture.

An important advantage of the concept of planetary rationality, particularly when compared with sustainable development, but also with ideas based on limiting growth, is the pointwise nature of its action. What is essential is not a comprehensive change of habits, but only change at those points where it will make a significant difference. This does not mean a rejection of the holistic perception of problems and the seeking of such solutions, but it implies a focus on the most important aspects, while at the same time minimising the negative effects in other areas. This means that where necessary, it is permissible for losses to arise, and so the principles of sustainable development are not implemented fully.

A starting point for such thinking might be, for example, the principles put forward by H. Daly(1990):

4) Exploit renewable resources no faster than they can be regenerated.
5) Deplete non-renewable resources no faster than the rate at which renewable substitutes can be developed.
6) Emit wastes no faster than they can be safely assimilated by ecosystems.

For these principles to be put into practice within the framework of the ideas of sustainable development and steady state economics, time is required. It is therefore rational to focus chiefly on the areas which require the most urgent action, namely those where the risk of occurrence of global threats is the greatest.

Here, action should be taken across economic, cultural, political and social divides. The principles should also be implemented in other areas, but this need not be done with such intensity.

The first step on the path to planetary rationality therefore involves defining areas of risk. In line with the concept described, these have the form of priority issues which are fundamental to the survival of humanity. They should constitute a foundation that bonds together different societies with differing cultural and political roots, and with inhomogeneous viewpoints on the further development of the world. The above-mentioned initiatives such as Planetary Boundaries and Global Catastrophic Risks are helpful in this regard, because they indicate the most important threats, which ought also to be arranged in a hierarchy based on probability of occurrence and scale of consequences, to make it possible to react first to those which are most likely to occur and have the greatest potential impact.

The second step is to develop the most appropriate method for solving the problem. Clearly no global problem has a simple solution. In many cases it will be necessary to apply several methods. These include both direct instruments (including norms, directives, regulations concerning the use of resources, etc.) as well as indirect ones (fiscal instruments, taxes, charges, subsidies and grants). Irrespective of whether those tools are of an economic or of a legal and administrative nature, the primary criterion for their application should be the effects achieved (Prandecki, 2008).

In parallel with this second stage, it is also possible to initiate the third, namely widespread action to increase social awareness of certain problems and the best ways of avoiding them. The examples of informational activity in relation to climate change and the interest surrounding UThant's report (Prandecki and Sadowski, 2010) show that giving suitable exposure to problems increases awareness of threats and accelerates the process of counteracting them. Increasing awareness must involve action in many directions, being addressed to politicians, to experts who might be able to find solutions, and to society as a whole. This last factor is particularly important in areas where costs have to be incurred, because in most countries social acceptance is seen by the authorities as a necessary condition for the taking of difficult decisions.

By far the greatest difficulty is associated with the next step, namely implementation of the criteria of planetary rationality. The likelihood that they will be implemented at the same time in all or most of the countries of the world is negligible, since this could be done only through the establishment of a world government. Such an act would represent too great an interference in national sovereignty, and must be considered unrealistic within the period up to 2050. More probable is the agreement of joint positions, for example through the United Nations. It would be possible to adopt, by voting, a certain set of norms (standards) relating to the permissible level of pressure on the environment accompanying specified types of agricultural activity. It must be remembered, however, that such a package would be a result of negotiation, and hence of compromise, which implies a lesser impact and reduced effectiveness in preventing a breakdown of civilisation. For this reason, an equally beneficial effect might be produced by the implementation of criteria of planetary rationality in certain leading economies (such as those of China and the United States), as they might then spread to other countries by way of imitation.

This approach means that the scope of activity on a planetary scale is limited, but in view of the difficulties in managing affairs at a global level, any greater engagement is impossible. An attempt to reach a worldwide

understanding that may be considered to align with the principles of planetary rationality is represented by the Millennium Development Goals (MDGs). These aim to reduce social inequality and human pressure on the environment on a global scale, and thus represent a way of reducing the risk of occurrence of threats of a global nature. Nonetheless, their fragmentary nature (for example, the goal of a reduction in the percentage of the population suffering hunger, without any attempt to establish successive targets for subsequent years) shows that this initiative is aimed at reducing, rather than eliminating, the risk of problems occurring. It would be rational to strive for the total elimination of a given problem (subject to a certain degree of tolerance), while recognising that this has to take place in stages. Discussions are currently under way to reach agreement on actions to be taken after 2015.It can be expected that in the most important areas, these will represent a continuation of the actions taken hitherto, but this is not certain. It should also be noted that, from the standpoint of planetary rationality, the MDGs are only a substitute for action, as they focus chiefly on current social targets,without aiming towards a long-term elimination of threats, and practically ignore economic factors. As regards this last point, it is necessary to underline the particular role played by international financial movements and the absence of control over them, which is more and more frequently coming to be cited as the primary source of crises and the reason for their propagation (Lietaer et al., 2012).

The last stage in the cycle involves evaluating the effects achieved and comparing them with the targets set. Considering the scale of action and the variable nature of problems over time, it must be accepted that it is not possible to designate priority areas just once and to adhere continuously to an adopted strategy. The occurrence of external factors (evolution of threats), scientific progress (enabling dangers to be better identified), and the variable effectiveness of action in particular areas will make it necessary to revise the fundamental assumptions. It is therefore rational to take account in the medium term (every few years) of the need to evaluate the monitoring of existing phenomena and to repeat the procedure where necessary.

A fundamental doubt exists with regard to the implementation of the aforementioned procedure. This concerns, as already mentioned, the question of the possibility of taking action on a global scale. People are naturally individualistic. Cultural and economic differences, historical experience and adopted development goals mean that the agreement of common priorities which are acceptable on a global scale is extremely difficult. We know from the past that people are prone to undertake common efforts chiefly in situations where an external threat bonds together the whole of society. In the case of problems affecting the entire planet, a threat would again be the most effective integrating factor. If the threat were external in nature (for example, the risk of impact with a large cosmic body, or a hypothetical alien invasion) this would happen relatively easily. With threats of terrestrial origin, such as the risk of exhaustion of natural resources, effective reaction is more difficult, because the effects of such an occurrence would not be proportional. Countries with relatively good access to the resources in question (in quantities that might suffice for a longer time) would be reluctant to share with others, leading to antagonism. For this reason, the possibility of counteracting such phenomena on a global scale is often described as a useful utopia. Acting in accordance with the principles of planetary rationality means not only entering into joint undertakings, but also seeking new solutions, which in the case of raw materials management means seeking replacements and new, better technologies. In this way it may transpire that internal barriers to development are a sufficient factor to cause global solutions to be implemented across the entire planet.

Implementation of the principles of planetary rationality is linked primarily to changes in economic theory. It is necessary to introduce a new field, planetary economics. Theoretically such action may seem premature or even utopian, because it does not result from economic reality, but represents an attempt to create a new reality. In practice, globalisation has already led to the creation of economic relations with a scope embracing the whole planet. Comparing the present situation with that of a hundred years ago,when changes meant that economics was beginning to take on a national character (leading to the birth of macroeconomics as a separate field), we may notice the analogy with present times and the need to develop economic rules applicable on a global scale.

The argument that it is not possible to make such a change also appears misconceived. The experience of 1942, when the US economy, still emerging from the depression, was reoriented towards military production in the course of just a few months, shows that major changes are possible even on a large scale. A shift in global thinking onto the path of rational action to ensure the continued existence of humanity is also possible. Considering how the understanding of security has evolved since the start of the 21st century (James and Teichler, 2014), it can be assumed that issues of the survival of humanity in conditions similar to those existing at present will more and more frequently be identified among the fundamental elements of security. This is important, in particular, when we consider the consequences of the current path of development. The statement that the world economy is unsustainable in nature does not arouse any controversy. Many more doubts arise in relation to attempts to determine the consequences of that situation. It would appear that the most perceptible consequences will be those affecting the food supply (Brown, 2012), which will be linked to a whole series of adverse external effects. Even now, the situation in that regard indicates an unfavourable trend in agricultural productivity. Proposed solutions should therefore be linked to the market to the greatest degree possible. The removal of threats means incorporating into the economic calculation both their sources and effective methods of eliminating them.

6. Conclusions

Existing trends in development are based on an economic calculation which neglects a number of external effects. The effort to reach the economic optimum being the goal of neoclassical economicsalso ignores these effects. Thus the problem arises of reduced availability of many public goods which are socially desirable. In the face of the growing human population and increasing consumption, neglecting the importance of public goods may have catastrophic consequences. This is visible, for instance, in agriculture, where soil erosion and loss of soil organic matter are slowing the rate of growth of food production. In the long term this may even lead to a food deficit (Brown, 2012).

Planetary rationality not only takes account of external effects, enabling minimisation of the risk of loss of the social optimum, but also analyses problems on a global scale. This in turn provides an opportunity for the widespread adoption of actions to ensure the survival of humanity. The principles of this concept can be applied independently of one's point of view concerning rationality in decision-making processes. Adherents both of the neoclassical ideas of full rationality, and of behavioural economics, which draws attention to the

limited scope of rational decision-making, ought to be able to accept the possibility of the rational shaping of the future path of development, as regards those aspects which are of greatest importance from the standpoint of global security.

Implementation of the criteria of planetary rationality will probably entail a rise in the costs of economic activity. This process is not easy to achieve, as it requires global consensus. It would nonetheless appear that it is possible. The first step in that direction is to increase awareness of the risk of occurrence of threats and to build solid theoretical foundations. These can then be used as a basis for increasing social awareness of the consequences of current trends. The negotiation and adoption of an appropriate economic policy will come about only as a consequence of such action.

It should be noted that the concept of planetary rationality is not identical to that of sustainable development. It is a simplified form of the latter, having as its goal only the solution of the most urgent problems. At the same time, implementation of the principles of planetary rationality is essential for sustainable development. It is a starting point enabling further action. At the present time, in highly developed countries, there is a strong tendency to create detailed local strategies for sustainable development, which lose sight of global goals. Such activities include, for example, integrated landscape management and local biodiversity protection. Hence planetary rationality should be regarded as a necessary condition for implementation of the concept of sustainable development.

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